

Inquiry and Investigation Lesson Plan

Lesson Plan

Taken from Eggen P. D., & Kauchak D. P. (2001)

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Core Curriculum standard Fulfilled: Standard II: Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.

Core Curriculum Objective Fulfilled:

Objective 2: Generalize the dependent relationships between organisms.

- A. Categorize the relationships between organisms (i.e., producer/consumer/decomposer, predator/prey, mutualism/parasitism) and provide examples of each.

Intended Learning Outcomes (ILO's) Fulfilled:

1. Use Science Process and Thinking Skills
 - a. Observe objects and events for patterns and record both qualitative and quantitative information.
 - b. Sort and sequence data according to a given criterion.
 - c. Develop and use categories to classify subjects studied.
3. Demonstrate Understanding of Science Concepts and Principles
 - a. Know and explain science information specified for their grade level.
 - b. Distinguish between examples and non-examples of concepts that have been taught.
 - c. Compare concepts and principles based upon specific criteria.
 - d. Solve problems appropriate to grade level by applying scientific principles and procedures.

Time Needed To Complete Inquiry: Approximately one 45 minute class period

Inquiry: Students will practice forming and testing hypotheses through compare and contrast methods and the analysis of data.

Prior Knowledge Needed: None

Introduction: Since this model is quite different from traditional teaching, the procedure may initially be confusing. It is best to introduce the model using concepts that students are familiar with. Topics such as living things, animals, wooden objects, prime numbers, or even students with red hair are all simple, concrete topics that would help students get used to the procedure.

Materials / Resources Needed for the Investigation: The lesson requires the use of an overhead projector and teacher generated examples and non-examples of the concept being attained.

Procedures of the Investigation:

- The teacher presents positive and negative example(s).

- Students generate hypotheses.
- The teacher presents additional positive and/or negative example(s).
- Students analyze hypotheses and eliminate those not supported by the data (examples).
- Students offer additional hypotheses if the data support them.
- Analyzing hypotheses, eliminating those invalidated by new examples, and offering additional hypotheses continues until one hypothesis is isolated.

Data Collection: Data for the investigation is provided by the teacher. Selecting examples that best illustrate the characteristics of the concept is most important step in the generation of data. Examples are selected so that each contains the combination of essential characteristics held by the concept. None of the non-examples contain the same combination. Having selected the examples and non-examples, the final planning task is to put them in sequence. Practicing hypothesis testing is an important goal when the Concept-Attainment Model is used. The examples should be arranged so the students are given the most practice with analyzing hypotheses. The shortest route to a concept may not give students this opportunity, and it may not result in the deepest student understanding.

Closure: Once students have isolated a hypothesis, the lesson is ready for closure. At that point, the teacher asks the student to identify the critical characteristics of the concept and state a definition.

Assessment: Students classify additional examples as positive or negative and/or generate additional examples of their own.

Example Data for the Concept of Predators:

Apple	No
Robin	Yes
Banana	No
Hawk	Yes
Eagle	Yes
Truck	No
Airplane	No
Black Widow	Yes
Tiger	Yes
Computer	N
Trout	Yes
Rabbit	N
Shark	Yes
Bear	Yes
Deer	No
Cow	No
Bat	Yes
Prey-mantas	Yes
Buffalo	No
Lion	Yes
Coyote	Yes
Rattle Snake	Yes